Model Inter-comparison Using the LAS Interactive Earth Science Data Visualization Gallery (vizGal)

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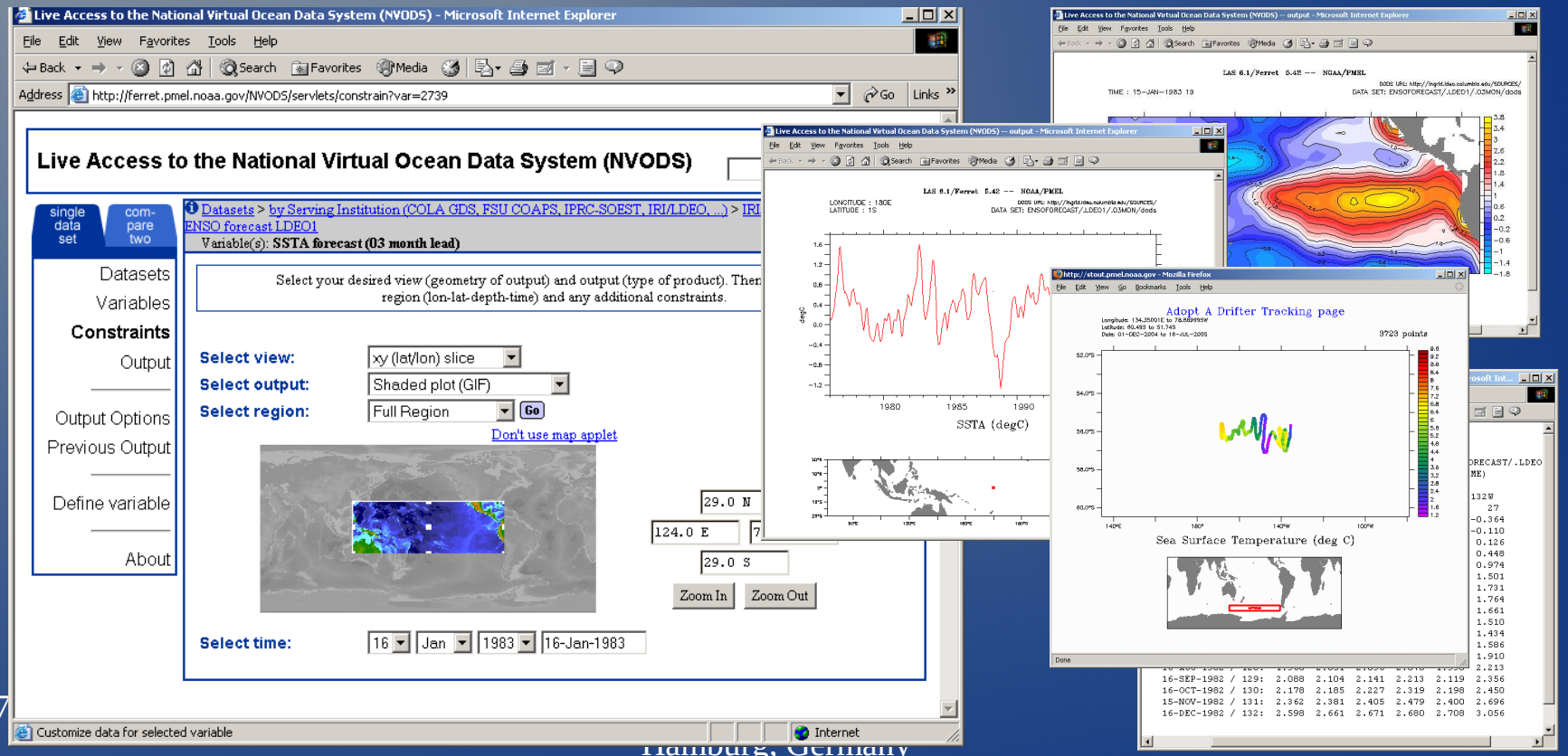
Ansley Manke, PMEL

Weathertop Consulting, LLC

The Live Access Server (LAS)

A highly configurable Web server designed to provide flexible access to geo-referenced scientific data

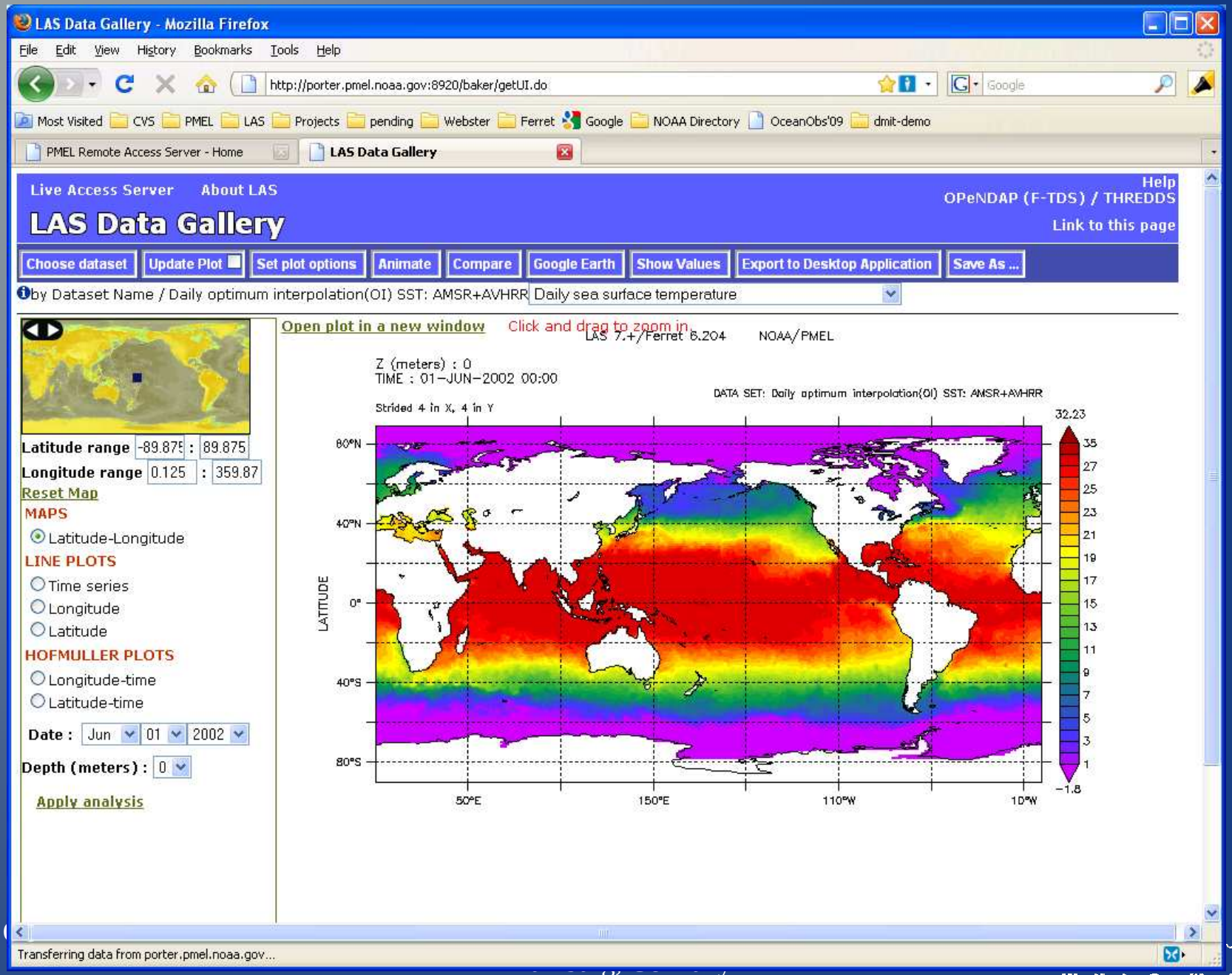


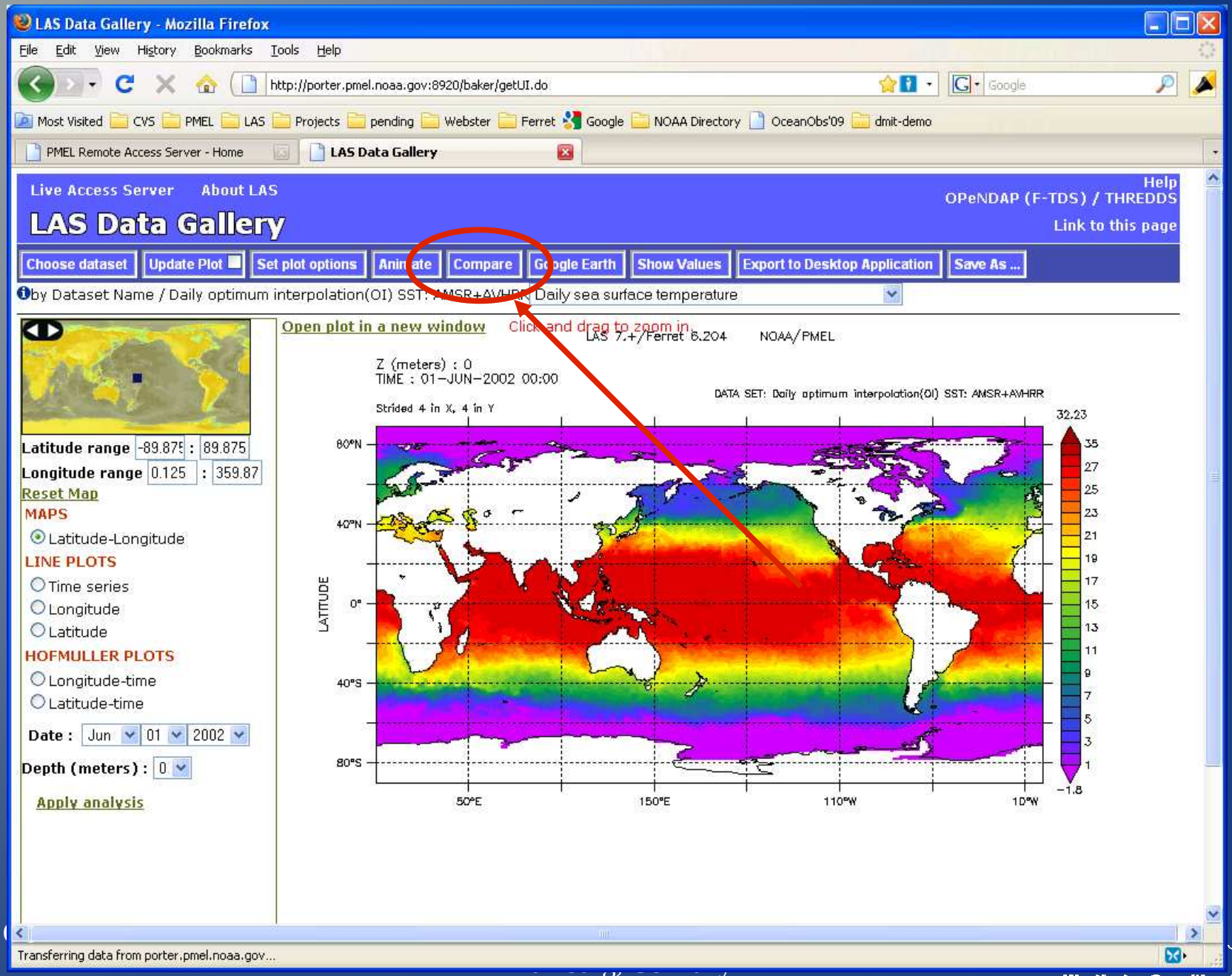
Hamburg, Germany

Weatherlop Consulting, LLC

vizGal is just another LAS product

- Interactive
- Contains many “sub-products”
- Contains some similar UI controls for data selection, time and region selection and control over the product options


LAS Data Gallery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
Live Access Server About LAS
Help
OPeNDAP (F-TDS) / THREDDS
Link to this page
LAS Data Gallery
Choose dataset Update Plot Set plot options Animate Compare Google Earth Show Values Export to Desktop Application Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Open plot in a new window
Click and drag to zoom in
LAS 7.+/Ferret 6.204
NOAA/PMEL
Z (meters) : 0
TIME : 01-JUN-2002 00:00
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
Strided 4 in X, 4 in Y
32.23
35
27
25
23
21
19
17
15
13
11
9
7
5
3
1
-1.8
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
Latitude range -89.875 : 89.875
Longitude range 0.125 : 359.87
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Date : Jun 01 2002
Depth (meters) : 0
Apply analysis
Transferring data from porter.pmel.noaa.gov...


LAS Data Gallery - Mozilla Firefox
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http://porter.pmel.noaa.gov:8920/baker/getUI.do
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PMEL Remote Access Server - Home
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Live Access Server About LAS
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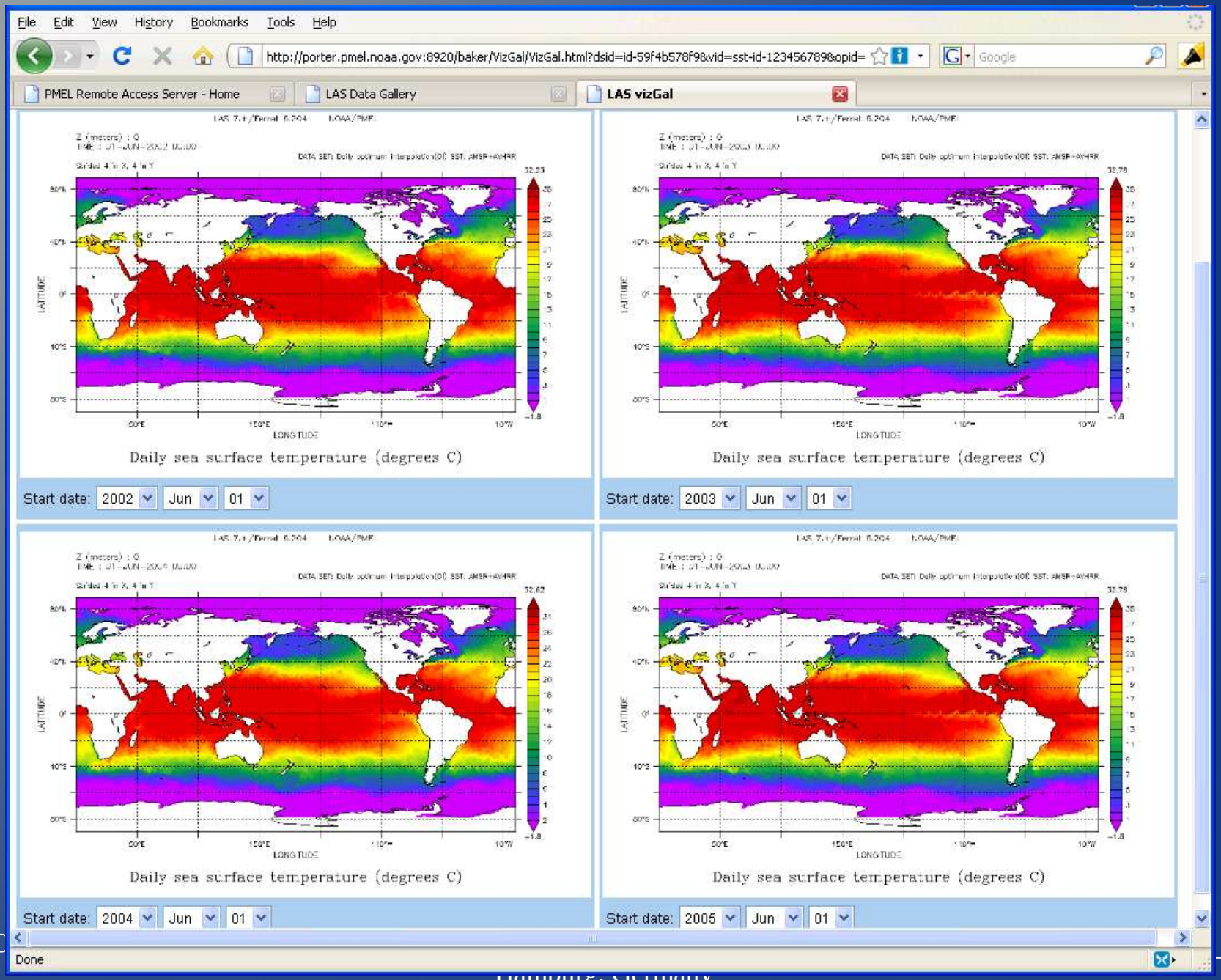
LAS Data Gallery
Choose dataset Update Plot Set plot options Animate Compare Google Earth Show Values Export to Desktop Application Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR Daily sea surface temperature
Open plot in a new window
Click and drag to zoom in
LAS 7.4/Ferret 6.204 NOAA/PMEL
Z (meters) : 0
TIME : 01-JUN-2002 00:00
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
Strided 4 in X, 4 in Y
Latitude range -89.875 : 89.875
Longitude range 0.125 : 359.87
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Date : Jun 01 2002
Depth (meters) : 0
Apply analysis
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
32.23
35
27
25
23
21
19
17
15
13
11
9
7
5
3
1
-1.8
Transferring data from porter.pmel.noaa.gov...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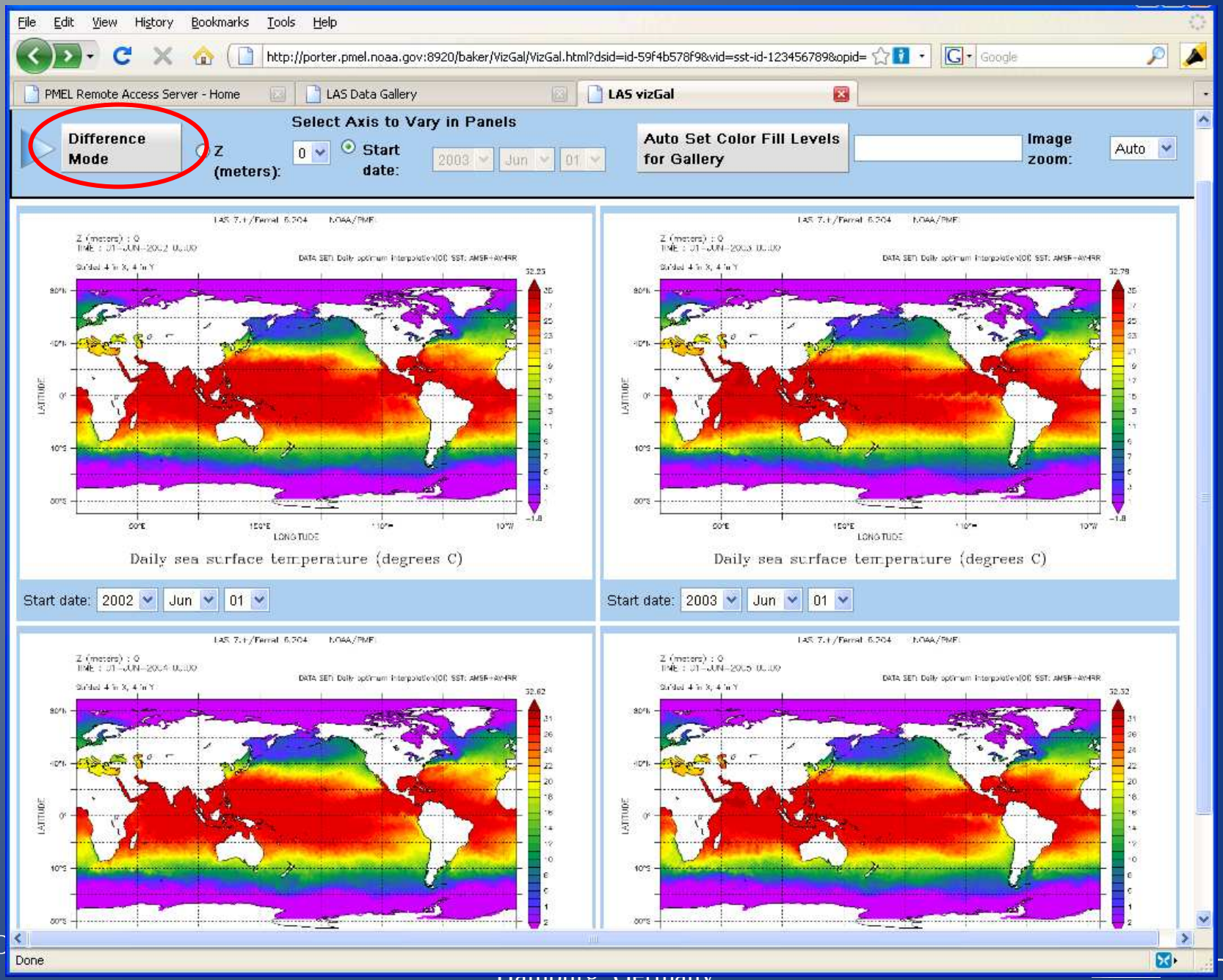
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Daily sea surface temperature (degrees C)
Start date: 2002 Jun 01
Daily sea surface temperature (degrees C)
Start date: 2003 Jun 01
Daily sea surface temperature (degrees C)
Start date: 2004 Jun 01
Daily sea surface temperature (degrees C)
Start date: 2005 Jun 01
Done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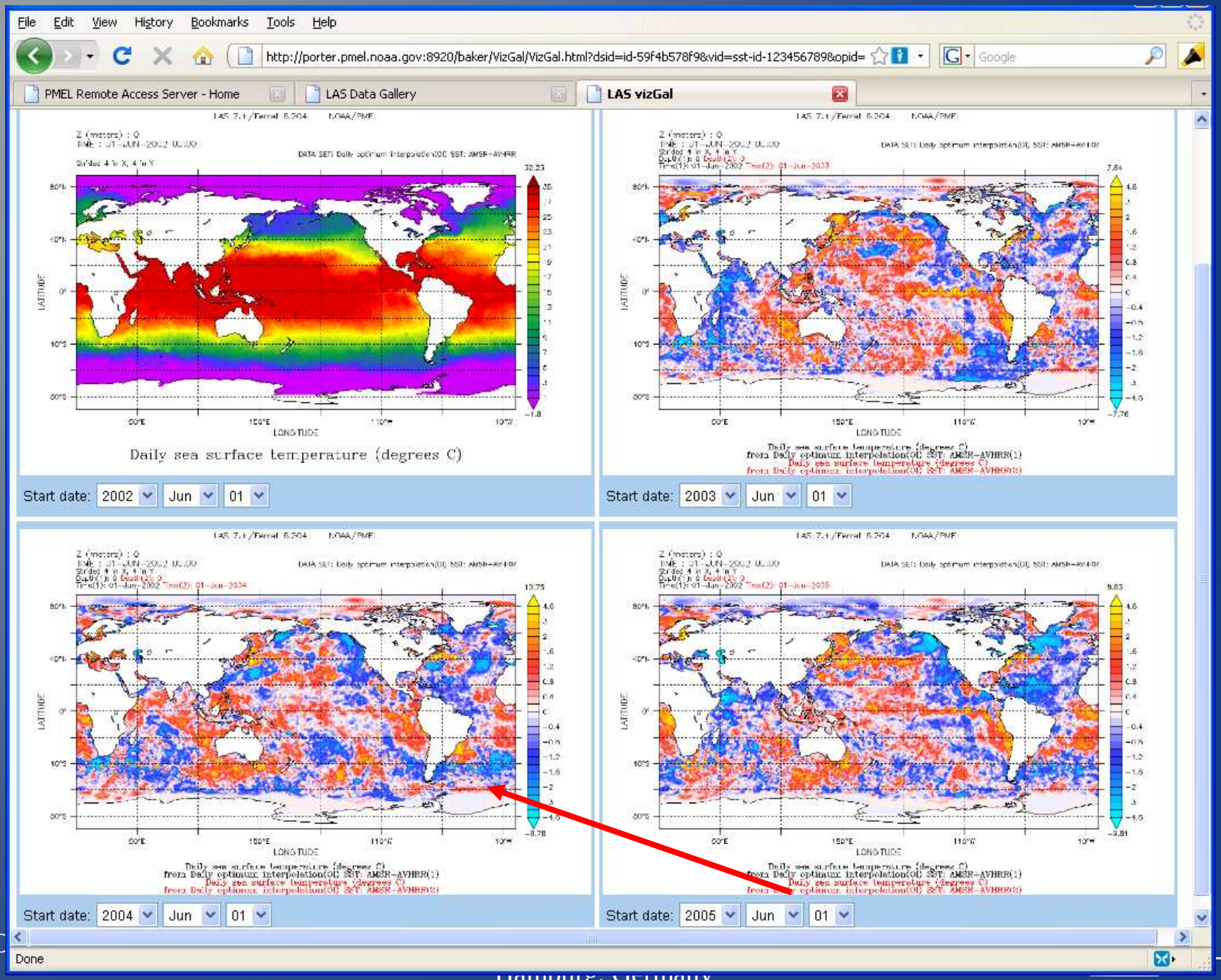
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
Select Axis to Vary in Panels
Start date:
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
Daily sea surface temperature (degrees C)
Start date: 2002 Jun 01
Daily sea surface temperature (degrees C)
Start date: 2003 Jun 01
Done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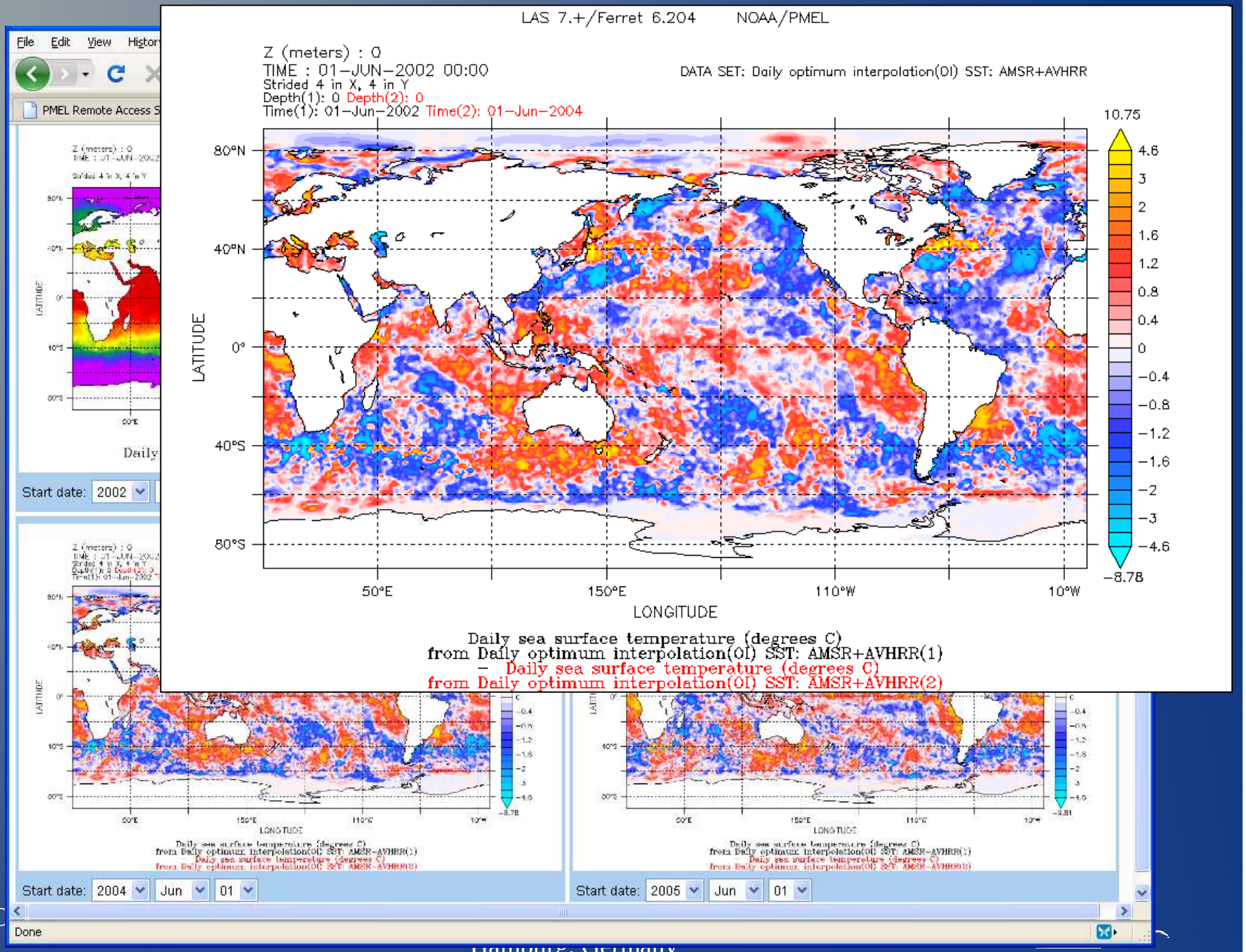
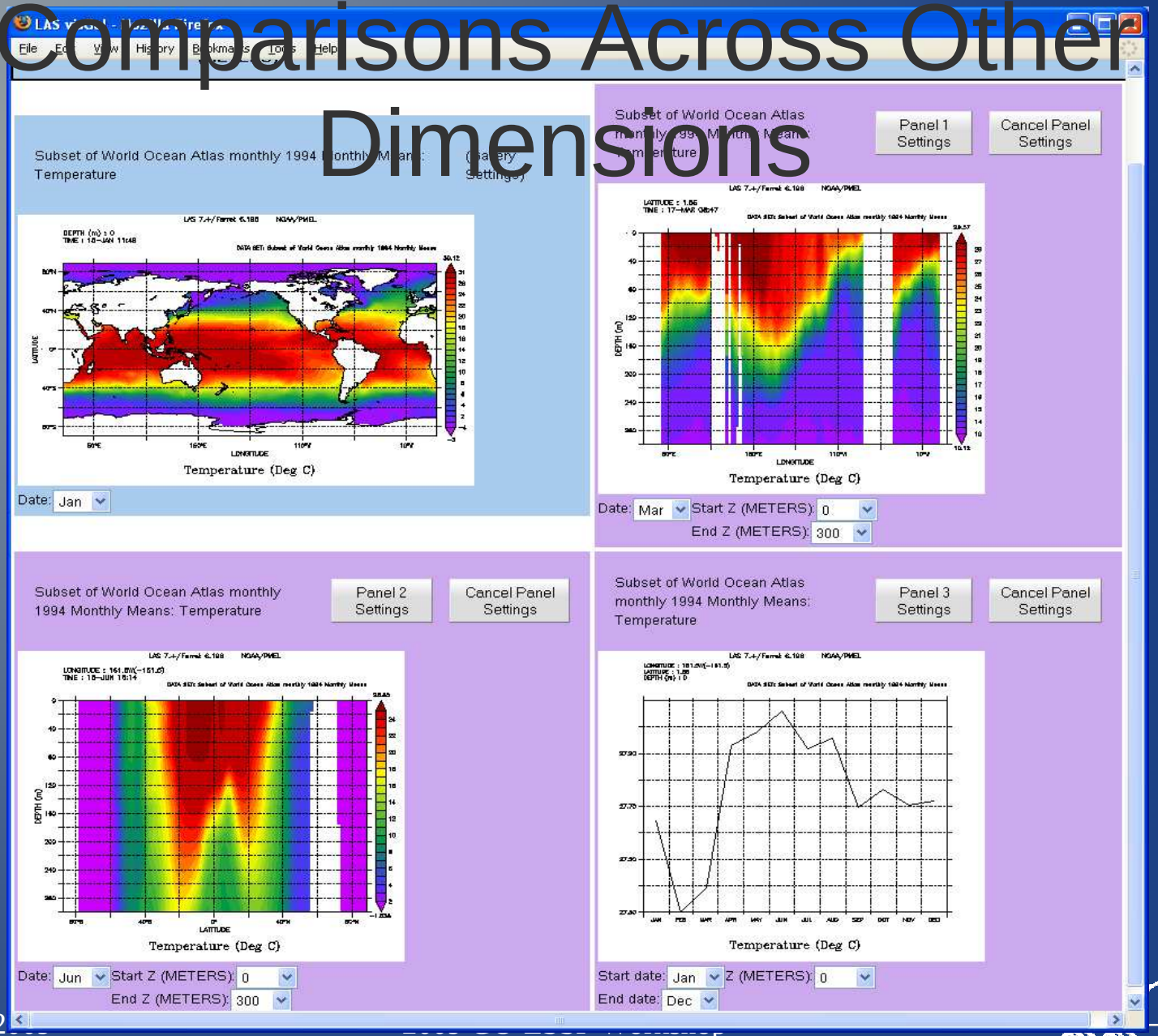
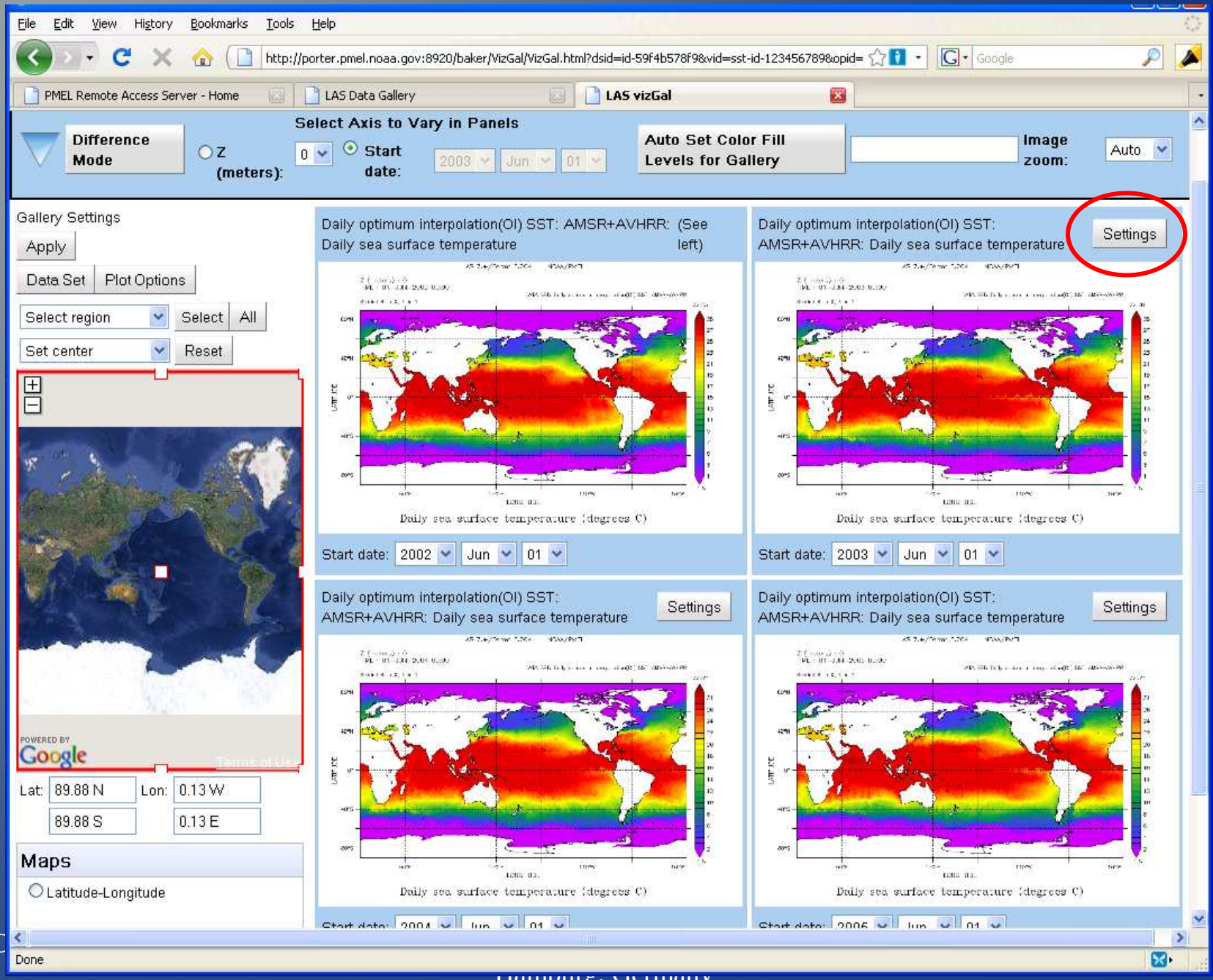
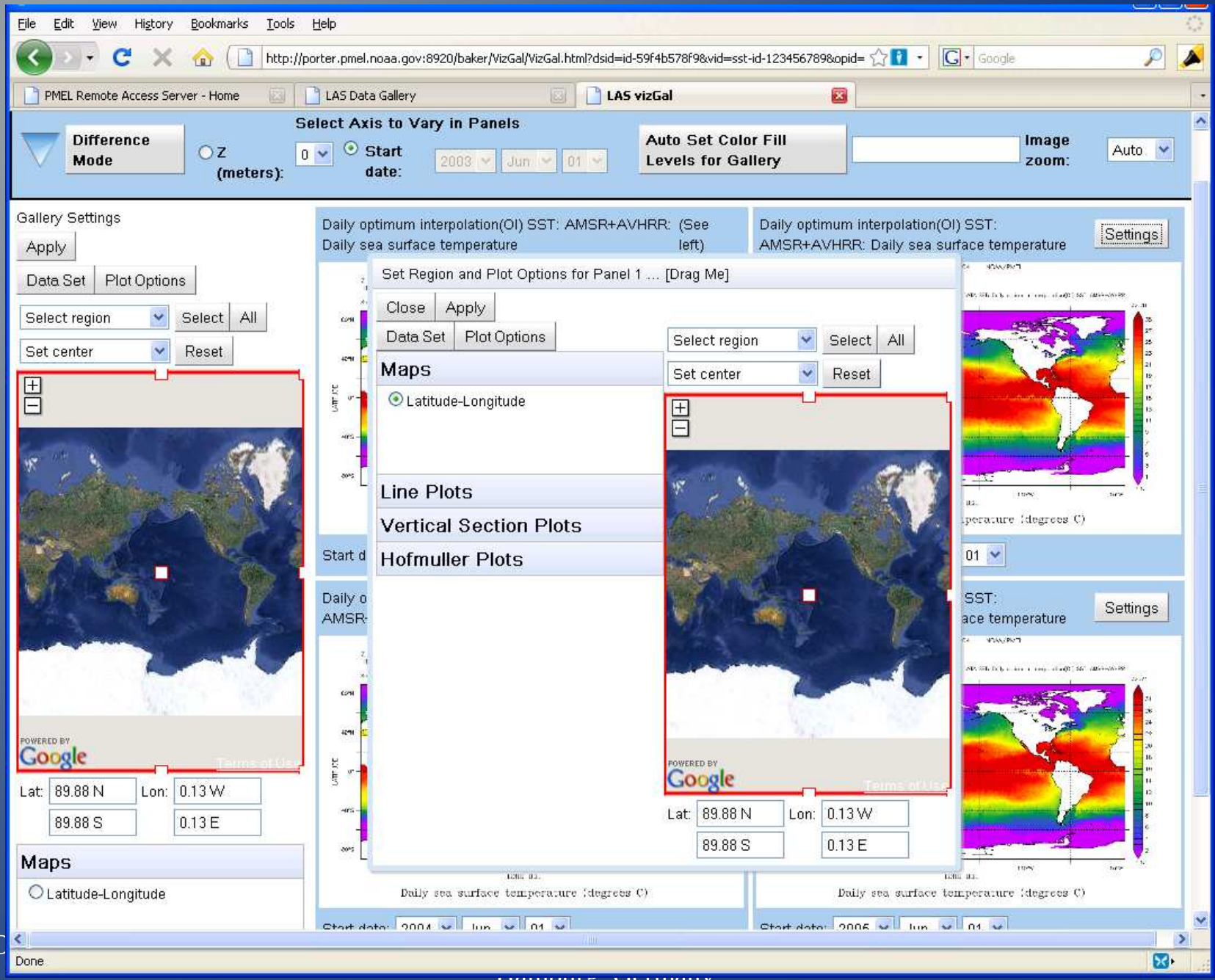
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Daily sea surface temperature (degrees C)
Start date: 2002 Jun 01
Start date: 2003 Jun 01
Start date: 2004 Jun 01
Start date: 2005 Jun 01
Done


LAS 7.+/Ferret 6.204 NOAA/PMEL
Z (meters) : 0
TIME : 01-JUN-2002 00:00
Strided 4 in X, 4 in Y
Depth(1): 0 Depth(2): 0
Time(1): 01-Jun-2002 Time(2): 01-Jun-2004
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
10.75
4.6
3
2
1.6
1.2
0.8
0.4
0
-0.4
-0.8
-1.2
-1.6
-2
-3
-4.6
-8.78
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
LONGITUDE
Daily sea surface temperature (degrees C)
from Daily optimum interpolation(OI) SST: AMSR+AVHRR(1)
Daily sea surface temperature (degrees C)
from Daily optimum interpolation(OI) SST: AMSR+AVHRR(2)
File Edit View
PMEL Remote Access S
Start date: 2002
Start date: 2004 Jun 01
Start date: 2005 Jun 01
Done

Comparisons Across Other Dimensions




File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
Select Axis to Vary in Panels
Start date:
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
Gallery Settings
Apply
Data Set
Plot Options
Select region
Select
All
Set center
Reset
Lat: 89.88 N
89.88 S
Lon: 0.13 W
0.13 E
Maps
Latitude-Longitude
Daily optimum interpolation(OI) SST: AMSR+AVHRR: (See left)
Daily sea surface temperature
Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature
Settings
Daily sea surface temperature (degrees C)
Start date: 2002 Jun 01
Start date: 2003 Jun 01
Start date: 2004 Jun 01
Start date: 2006 Jun 01
Done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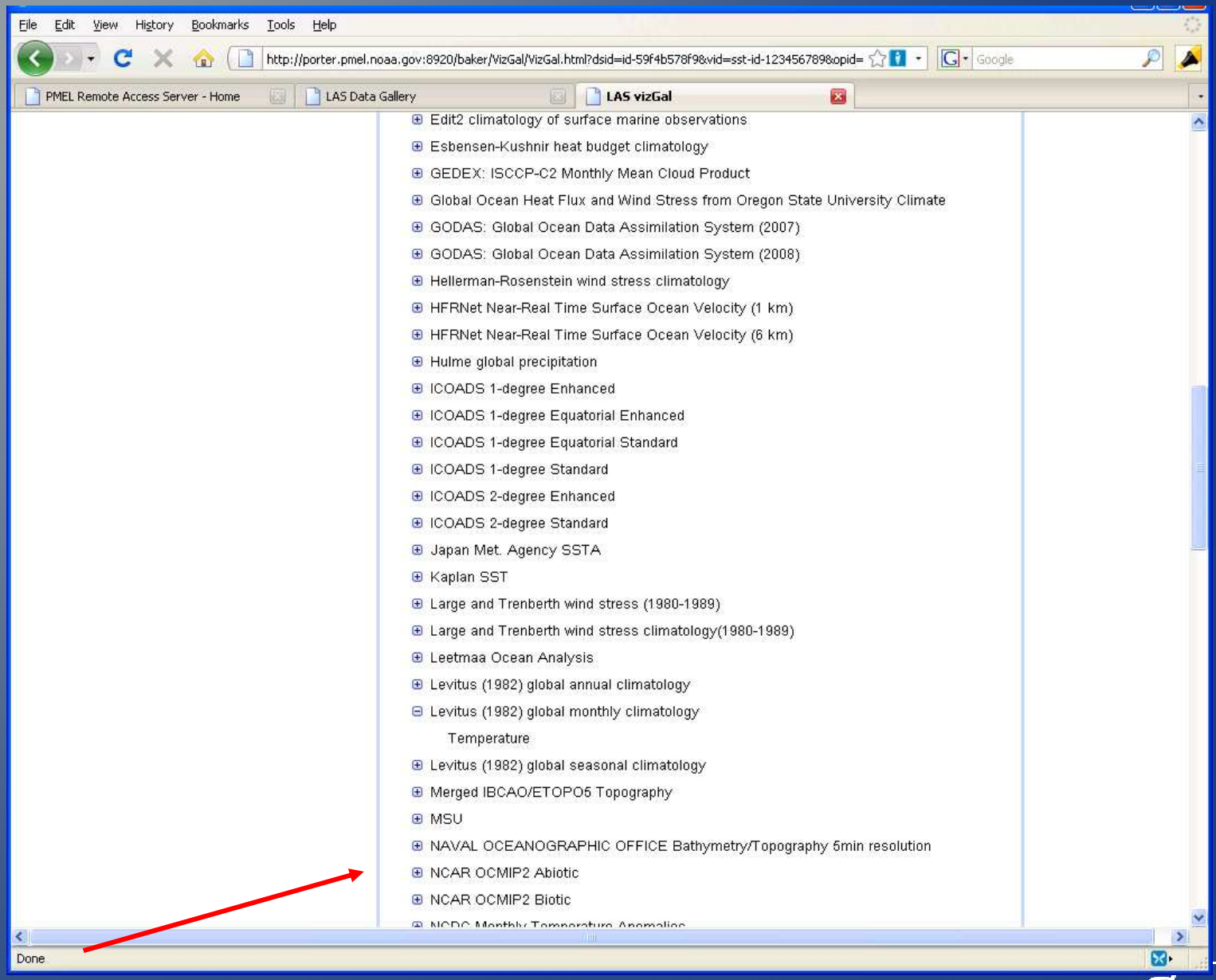
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
Select Axis to Vary in Panels
Start date:
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
Gallery Settings
Apply
Data Set
Plot Options
Select region
Select
All
Set center
Reset
Maps
Latitude-Longitude
Lat: 89.88 N
89.88 S
Lon: 0.13 W
0.13 E
Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature
Settings
Set Region and Plot Options for Panel 1 ... [Drag Me]
Close
Apply
Line Plots
Vertical Section Plots
Hofmuller Plots
Done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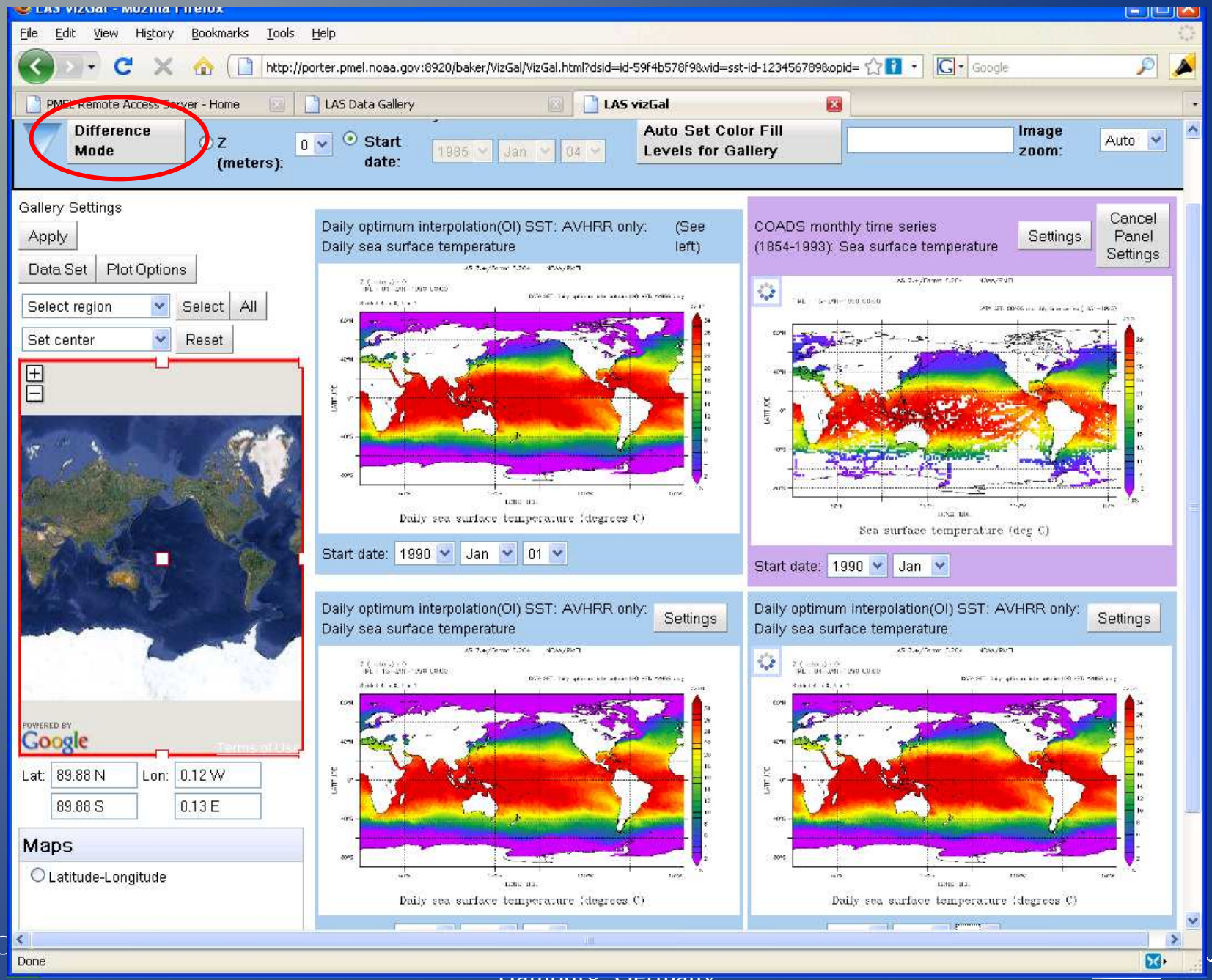
Google
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Edit2 climatology of surface marine observations
Esbensen-Kushnir heat budget climatology
GEDEX: ISCCP-C2 Monthly Mean Cloud Product
Global Ocean Heat Flux and Wind Stress from Oregon State University Climate
GODAS: Global Ocean Data Assimilation System (2007)
GODAS: Global Ocean Data Assimilation System (2008)
Hellerman-Rosenstein wind stress climatology
HFRNet Near-Real Time Surface Ocean Velocity (1 km)
HFRNet Near-Real Time Surface Ocean Velocity (6 km)
Hulme global precipitation
ICOADS 1-degree Enhanced
ICOADS 1-degree Equatorial Enhanced
ICOADS 1-degree Equatorial Standard
ICOADS 1-degree Standard
ICOADS 2-degree Enhanced
ICOADS 2-degree Standard
Japan Met. Agency SSTA
Kaplan SST
Large and Trenberth wind stress (1980-1989)
Large and Trenberth wind stress climatology(1980-1989)
Leetmaa Ocean Analysis
Levitus (1982) global annual climatology
Levitus (1982) global monthly climatology
Temperature
Levitus (1982) global seasonal climatology
Merged IBCAO/ETOPO5 Topography
MSU
NAVAL OCEANOGRAPHIC OFFICE Bathymetry/Topography 5min resolution
NCAR OCMIP2 Abiotic
NCAR OCMIP2 Biotic
Done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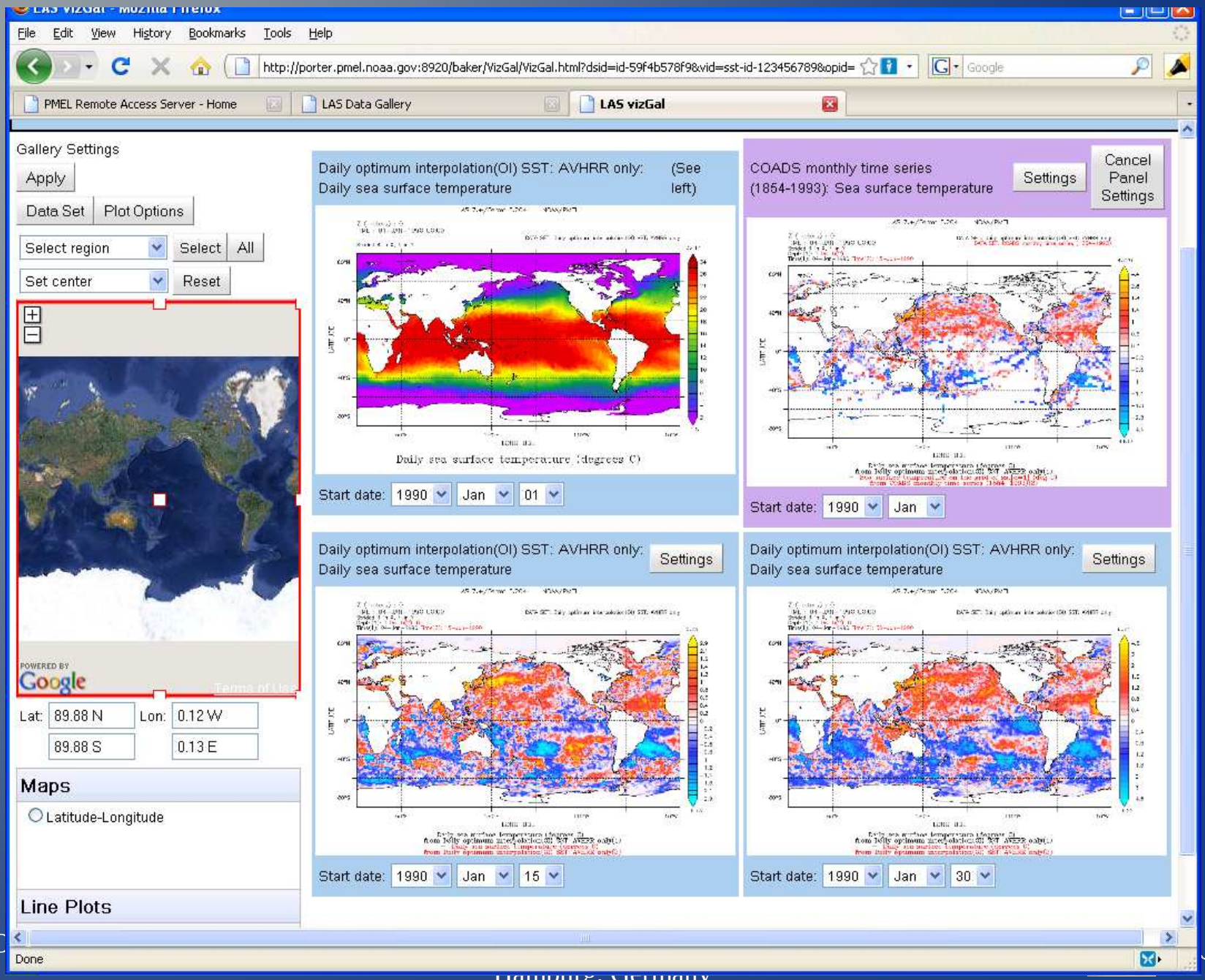
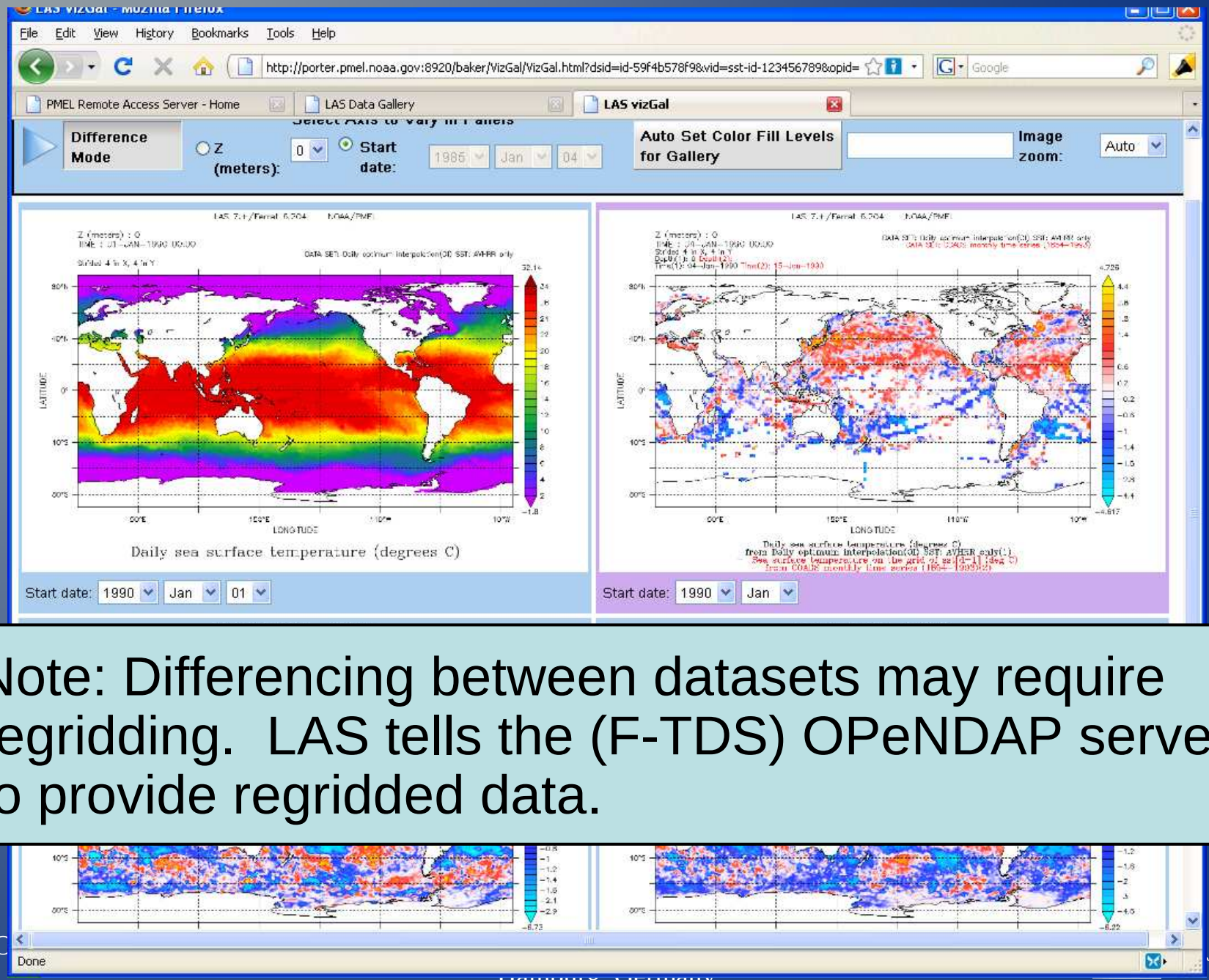
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
Start date:
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
Gallery Settings
Apply
Data Set
Plot Options
Select region
Select
All
Set center
Reset
Lat: 89.88 N
89.88 S
Lon: 0.12 W
0.13 E
Maps
Latitude-Longitude
Daily optimum interpolation(OI) SST: AVHRR only:
Daily sea surface temperature
(See left)
Daily sea surface temperature (degrees C)
Start date: 1990 Jan 01
COADS monthly time series
(1854-1993): Sea surface temperature
Settings
Cancel Panel Settings
Sea surface temperature (deg C)
Start date: 1990 Jan
Daily optimum interpolation(OI) SST: AVHRR only:
Daily sea surface temperature
Settings
Daily sea surface temperature (degrees C)
Daily optimum interpolation(OI) SST: AVHRR only:
Daily sea surface temperature
Settings
Daily sea surface temperature (degrees C)
Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Gallery Settings
Apply
Data Set
Plot Options
Select region
Select
All
Set center
Reset
POWERED BY Google
Lat: 89.88 N
89.88 S
Lon: 0.12 W
0.13 E
Maps
Latitude-Longitude
Line Plots
Daily optimum interpolation(OI) SST: AVHRR only:
Daily sea surface temperature
(See left)
Daily sea surface temperature (degrees C)
Start date: 1990 Jan 01
COADS monthly time series
(1854-1993): Sea surface temperature
Settings
Cancel Panel Settings
Start date: 1990 Jan
Daily optimum interpolation(OI) SST: AVHRR only:
Daily sea surface temperature
Settings
Start date: 1990 Jan 15
Daily optimum interpolation(OI) SST: AVHRR only:
Daily sea surface temperature
Settings
Start date: 1990 Jan 30
Done



Note: Differencing between datasets may require regridding. LAS tells the (F-TDS) OPeNDAP server to provide regridded data.

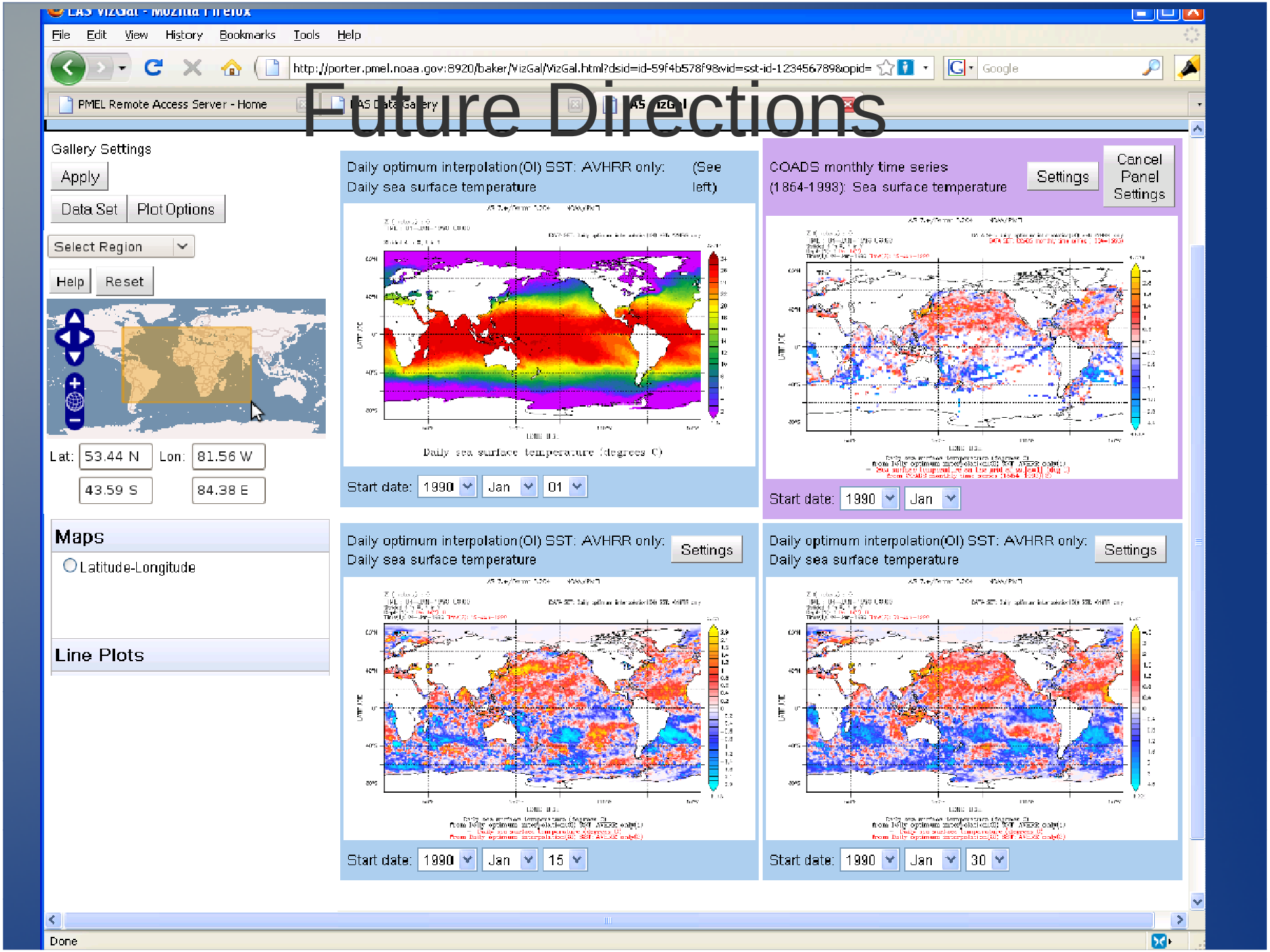
Implemented using GWT

- Google Web Toolkit (GWT)
- Code in Java using Eclipse IDE
- Debug in Eclipse with standard tools
- Easy Ajax communication using GWT RPC
- Reuse code on the client and the server
- GWT handles the browser quirks and incompatibility by cross-compiling 6 versions of JavaScript

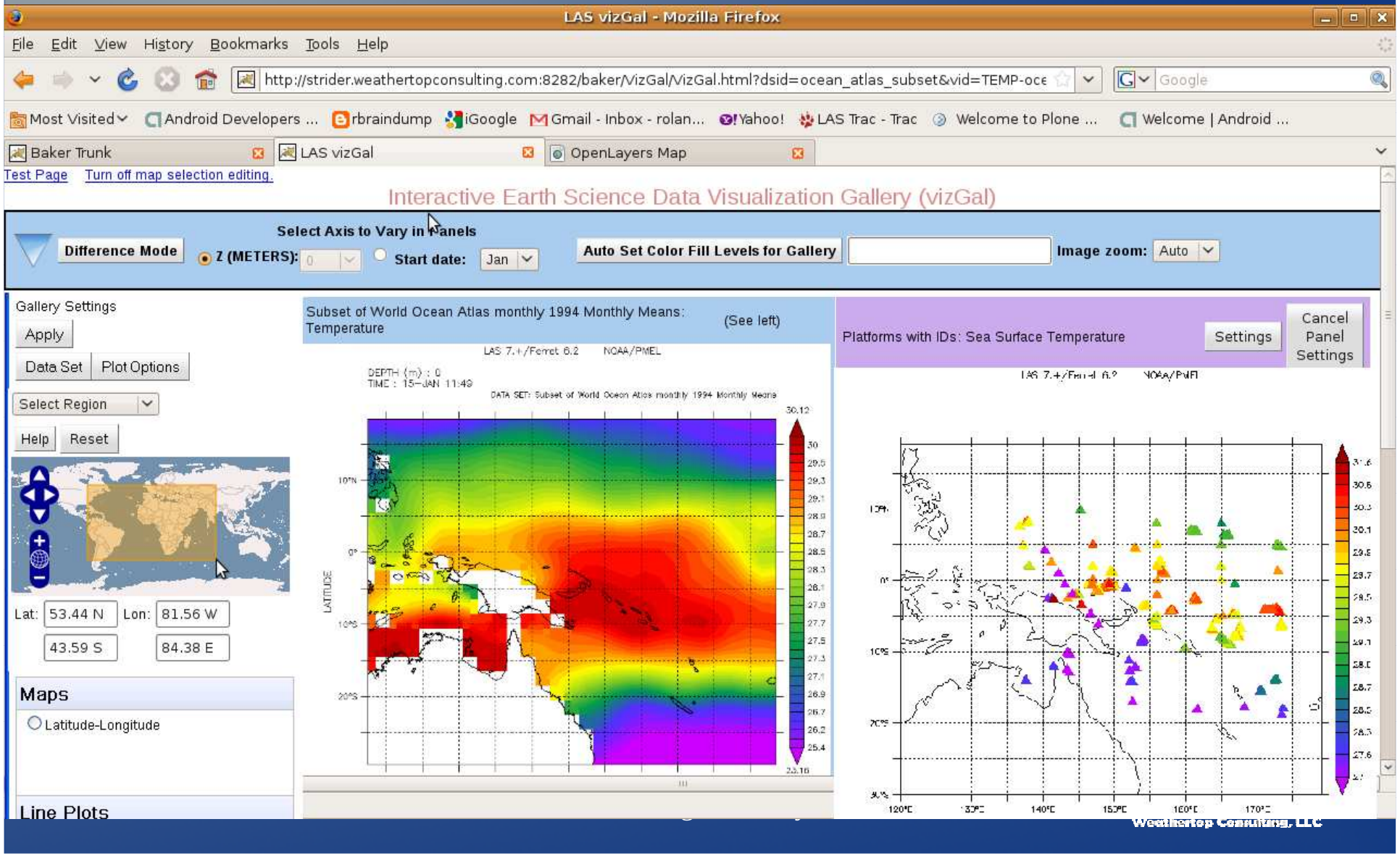
Implementation Details

- vizGal implements the GWT history mechanism so that the browser back and forward buttons do what you expect (mostly)
- Google Map Widget for region selection
- Map will be replaced by an OpenLayers implementation using GWT-OpenLayers (http://gwt-openlayers.sourceforge.net)

Future Directions



Future Directions



Other Ideas

- During yesterday's demos two people offered suggestions:
- Better interface for ensemble data
- Ability to send an OPeNDAP link or down load the data that has been re-gridded and differenced

Final Comments

- vizGal will be in the next release of LAS
- Will be part of the LAS UI that is deployed with ESG

Questions?